measurement interval generator

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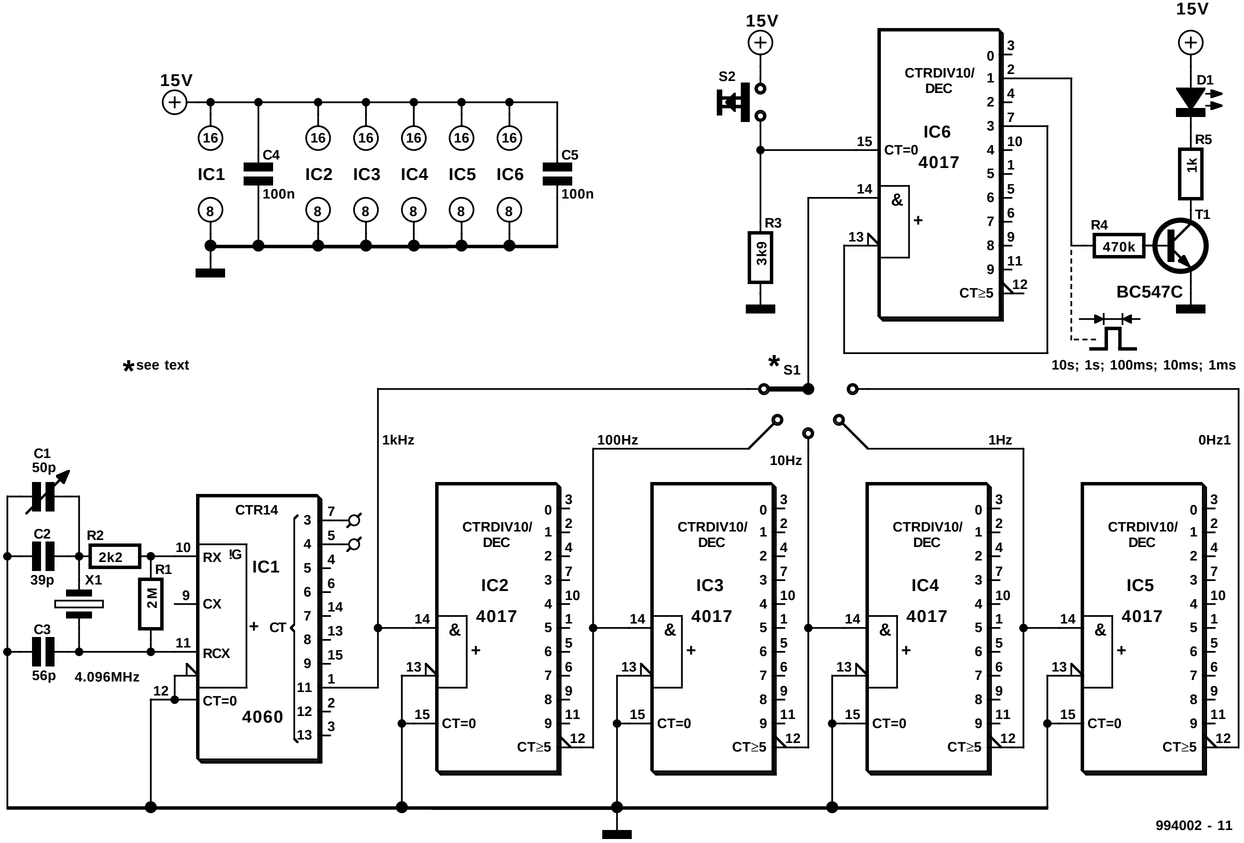

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The purpose of this circuit is to generate a pulse with a predefined duration when a button is pressed. It is especially well suited for use as a timing window generator for a frequency counter. It uses only inexpensive standard components and can be quickly put together.

In the schematic diagram, IC1 (a 4060) is a 14-stage binary counter with an integrated oscillator. An inexpensive 4.096 MHz crystal is used as the timing reference, which means that a 1 kHz signal appears at the output (pin 1) after division by 2^{14}. Following IC1 is a series of decimal counters (IC2 through IC5, type 4017) that are cascaded via their Carry Out outputs (pin 12). These counters produce reference frequencies of 100 Hz, 10 Hz, 1 Hz and 0.1 Hz.

The non-shorting rotary switch S1 selects one of the reference frequencies and applies it to the clock input of an additional 4017. In contrast to the other ICs of this type, its control inputs Reset and /Enable (pins 15 and 13) are used dynamically. When pushbutton S2 is pressed, the count is reset to zero. When S2 is released, the first rising edge at pin 14 clocks the counter. The input signal, divided by 2, appears at the Q1 output (pin 2). However, since Q3 (pin 7) is connected to the /Enable input, the counter is disabled after the first period of the output signal, so that only one pulse is generated. Depending on the input signal, this pulse has a length of 10 s, 1 s, 0.1 s, 0.01 s or 0.001 s.

A simple transistor buffer drives an LED that is illuminated for the duration of the pulse. An additional, similar buffer stage at the output would also be a good idea. The circuit should be powered from a stabilized 15 V supply. It draws around 10 mA.

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